IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (Currently Amended) Method of coding information symbols according to a code defined on a Galois field F_q, where q is an integer greater than 2 and equal to a power of a prime number, and of length $n = p(q-1)$, where p is an integer greater than 1, ~~characterized in that it comprises the following~~ comprising the steps of:

a) choosing a p-tuple of integers $(t_1,...,t_p)$ ~~is chosen~~ such that

$q-1 > t_1 > t_2 > ... > tp > 0$,

and a p-tuple of diagonal square matrices $(Y_1,...,Y_p)$ of dimension $(q-1)$ on F_q such that, for any i $(1 \leq i \leq q-1)$, the p elements in position (i,i) of these matrices $Y_1,...,Y_p$ are different in pairs,

b) placing the [[said]] information symbols ~~are placed~~ successively in p words $\underline{a}_l$ of length $(q-1- t_l)$ (where $l = 1, ... ,p$),

c) forming words $\underline{u}_l$ (where $l = 1, ... ,p$) ~~are formed~~ of length $(q-1)$, which constitute the components of the ~~"precoded word"~~ precoded word $\underline{u} = [\underline{u}_1\ \underline{u}_2 \ldots \underline{u}_p]$, by supplementing the corresponding word $\underline{a}_l$ by means of redundant symbols so that $\underline{u}_l$ is orthogonal to the matrix $H^{(t_l)}$, where the matrices $H^{(t)}$ are defined by

$H^{(t)}_{ij} = \gamma^{i(j-1)}$ $(1 \leq i \leq t, 1 \leq j \leq q-1)$, where γ is a symbol chosen from amongst the primitive elements of Fq, and

d) forming a code word

$$\underline{v} = [\underline{v}_1\ \underline{v}_2 \cdots \underline{v}_p]$$

~~is formed~~, where each word $\underline{v}_l$ ($l = 1,\ldots,p$) is of length (q-1), by resolving the system of equations

$$\begin{cases} \underline{v}_l + \underline{v}_2 + \ldots + \underline{v}_p = \underline{u}_l\ , \\ \underline{v}_1 Y_1 + \underline{v}_2 Y_2 + \ldots + \underline{v}_p Y_p = \underline{u}_2\ , \\ \underline{v}_1 Y^2{}_1 + \underline{v}_2 Y^2{}_2 + \ldots + \underline{v}_p Y^2{}_p = \underline{u}_3\ , \\ \ldots \\ \underline{v}_1 Y_1^{p-1} + \underline{v}_2 Y_2^{p-1} + \ldots + \underline{v}_p Y_p^{p-1} = \underline{u}_p\ . \end{cases}$$

2. (Currently Amended) Coding method according to Claim 1, ~~characterized in that~~ <u>in which</u> an algebraic equation in X and Y is considered such that, for any value γ^{i-1} ($i = 1,\ldots,q$-1) taken by X, [[said]] <u>the</u> algebraic equation has p distinct solutions denoted $y_l(\gamma^{i-1})$ (where $l = 1,\ldots,p$), and ~~in that~~ the diagonal element in position (i,i) of each of [[said]] <u>the</u> matrices Y_l is taken to be equal to $y_l(\gamma^{i-l})$.

3. (Currently Amended) Coding method according to Claim 1 or Claim 2, ~~characterized in that~~ <u>in which</u> each word a_l (where $l = 1,\ldots,p$) represents a respective approximation of resolution of an image coded at source.

4. (Currently Amended) Method of decoding received data resulting from the transmission of coded symbols according to Claim 1, ~~characterized in that it comprises the following~~ <u>further comprising the</u> steps <u>of</u>:

e) calculating, from the word received

$$\underline{r} = \left[\underline{r}_1\, \underline{r}_2 \cdots \underline{r}_p\right],$$

where each word $\underline{r}_l$ (l = 1,...,p) is of length (q-1), at least one of the components $\underline{s}_l$ (where l = 1,...,p) of length (q-1), of the ~~"post-received word"~~ post-received word $\underline{s} = [\underline{s}_1\ \underline{s}_2\ \ldots\ \underline{s}_p]$, ~~is calculated,~~ according to:

$$\begin{cases} \underline{s}_1 = \underline{r}_1 + \underline{r}_2 + \ldots + \underline{r}_p, \\ \underline{s}_2 = \underline{r}_1 Y_1 + \underline{r}_2 Y_2 + \ldots + \underline{r}_p Y_p, \\ \underline{s}_3 = \underline{r}_1 Y^2{}_1 + \underline{r}_2 Y^2{}_2 + \ldots + \underline{r}_p Y^2{}_p, \\ \qquad \cdots \\ \underline{s}_p = \underline{r}_1 Y_1^{p-1} + \underline{r}_2 Y_2^{p-1} + \ldots + \underline{r}_p Y_p^{p-1}, \end{cases}$$

and

f) calculating at least one of the components $\underline{\hat{u}}_l$ [(where l = 1,...,p) of length (q-1), of the ~~"post-associated word"~~ post-associated word $\underline{\hat{u}} = [\underline{\hat{u}}_l\ \underline{\hat{u}}_2 \ldots \underline{\hat{u}}_p]$, ~~is calculated,~~ and correcting the word $\underline{s}_l$ with the same l according to the error syndrome vector $H^{(l)} \cdot s_l{}^T$.

5. (Currently Amended) Method of decoding received data resulting from the transmission of coded symbols according to Claim 2, ~~characterized in that it comprises the following~~ further comprising the steps of:

e') applying a maximal error correction algorithm ~~is applied~~ to each received word $\underline{r}_l$ so as to obtain an estimation

$$\hat{v} = \left[\underline{\hat{v}}_1\, \underline{\hat{v}}_2 \ldots \underline{\hat{v}_p}\right],$$

where each word $\underline{\hat{v}}_l$ ($l = 1, \ldots, p$) is of length (q-1), of the corresponding transmitted word $\underline{v}$, and

f) <u>calculating</u> at least one of the components $\underline{\hat{u}}$ (where $l = 1,\ldots,p$), of length (q-1), of the ~~"post-associated word"~~ <u>post-associated word</u> $\underline{\hat{u}} = [\underline{\hat{u}}_1\, \underline{\hat{u}}_2 \ldots \underline{\hat{u}}_P]$, ~~is calculated,~~ according to:

$$\begin{cases} \underline{\hat{u}}_1 = \underline{\hat{v}}_1 + \underline{\hat{v}}_2 + \ldots + \underline{\hat{v}}_p, \\ \underline{\hat{u}}_2 = \underline{\hat{v}}_1 Y_1 + \underline{\hat{v}}_2 Y_2 + \ldots + \underline{\hat{v}}_p Y_p, \\ \underline{\hat{u}}_3 = \underline{\hat{v}}_1 Y^2_1 + \underline{\hat{v}}_2 Y^2_2 + \ldots + \underline{\hat{v}}_2 Y^2_p \\ \qquad\qquad \ldots \\ \underline{\hat{u}_p} = \underline{\hat{v}}_1 Y_1^{p-1} + \underline{\hat{v}}_2 Y_2^{p-1} + \ldots + \underline{\hat{v}}_p Y_p^{p-1}. \end{cases}$$

6.-10. (Canceled)

11. (Currently Amended) Device ~~(102)~~ for coding information symbols according to a code defined on a Galois field $\mathbf{F}q$, where q is an integer greater than 2 and equal to a power of a prime number, and of length $n = p(q\text{-}1)$, where p is an integer greater than 1, ~~characterized~~ in ~~that,~~ <u>which</u> a p-tuple of integers $(t_1,\ldots,t_p)$ such that

$$q\text{-}1 > t_1 > t_2 > \ldots > t_p > 0,$$

and a p-tuple of diagonal square matrices $(Y_1,\ldots,Y_p)$ of dimension $(q\text{-}1)$ on $\mathbf{F}_q$ such that, for any i $(1 \leq i\ q\text{-}1)$, the p elements in position (i,i) of these matrices $Y_1,\ldots,Y_p$ are different in pairs, having been chosen, it is able to:

[[-]] place [[said]] <u>the</u> information symbols successively in p words $\underline{a}_l$ of length $(q\text{-}1\text{-}\ t_l)$ (where $l = 1,\ldots,p$),

[[-]] form words $\underline{u}_l$ (where $l = 1,\ldots,p$) of length $(q\text{-}1)$, which constitute the components of the ~~"precoded word"~~ <u>precoded word</u> $\underline{u} = [\underline{u}_1\ \underline{u}_2 \ldots \underline{u}_p]$, supplementing the corresponding word $\underline{a}_l$ by means of redundant symbols so that $\underline{u}_l$ is orthogonal to the matrix $H^{(t_l)}$, where the matrices $H^{(t)}$ are defined by $H^{(t)}_{ij} = \gamma^{i(-1)}$ $(1 \leq i \leq t,\ 1 \leq j \leq q\text{-}1)$, where γ is a symbol chosen from amongst the primitive elements of $\mathbf{F}q$, and

[[-]] form a code word

$$\underline{v} = [\underline{v}_1\ \underline{v}_2 \cdots \underline{v}_p],$$

where each word v_l $(l = 1, \ldots, p)$ is of length $(q\text{-}1)$, by resolving the system of equations

$$\begin{cases} \underline{v}_l + \underline{v}_2 + \ldots + \underline{v}_p = \underline{u}_l, \\ \underline{v}_1 Y_1 + \underline{v}_2 Y_2 + \ldots + \underline{v}_p Y_p = \underline{u}_2, \\ \underline{v}_1 Y^2{}_1 + \underline{v}_2 Y^2{}_2 + \ldots + \underline{v}_p Y^2{}_p = \underline{u}_3, \\ \underline{v}_1 Y_1^{p-1} + \underline{v}_2 Y_2^{p-1} + \ldots + \underline{v}_p Y_p^{p-1} = \underline{u}_p. \end{cases}$$

12. (Currently Amended) Coding device according to Claim 11, ~~characterized in that it~~ <u>wherein the device</u> is also able to assign the value $y_l\ (\gamma^{i-1})$ to the diagonal element in position (i,i) of each of [[said]] <u>the</u> matrices Y_l, where, for a

predetermined algebraic equation in X and Y, [[said]] the algebraic equation has p distinct solutions denoted y_l (γ^{i-1}) (where l = 1,...,p) for any value γ^{i-1} (i = 1,...,q-1) taken by X.

13. (Currently Amended) Device [[(10)]] for decoding received words r resulting from the transmission of coded words $\underline{v}$ ~~according to the invention~~, ~~characterized in that it comprises~~ comprising:

[[-]] an error correction unit [[(107)]] able to apply an error correction algorithm to each word received $\underline{r}$, so as to supply at least one component $\underline{\hat{u}}_l$ (where l = 1,...,p) of a ~~"post-associated word"~~ post-associated word $\underline{\hat{u}}$, and

[[-]] a redundancy elimination unit [[(108)]] able to remove from [[said]] the component $\underline{\hat{u}}_l$ the symbols situated at the positions identical to the positions of the component $\underline{u}_l$ with the same l of the corresponding precoded word $\underline{u}$, in which redundant symbols were placed at the time of coding.

14. (Canceled)

15. (Currently Amended) Information data transmission apparatus [[(48)]], ~~characterized in that it comprises~~ comprising a coding device according to Claim 11 or Claim 12~~, as well as~~ and a modulator [[(103)]] for modulating the data resulting from the coding of [[said]] the information data.

16. (Currently Amended) Data reception apparatus [[(70)]], ~~characterized in that it comprises~~ comprising a demodulator [[(106)]] for demodulating the received data~~;~~ ~~as well as~~ and a decoding device according to Claim 13.

17. (Currently Amended) Information data transmission apparatus [[(48)]], ~~characterized in that it comprises~~ comprising a coding device according to Claim 11 or Claim 12, an interleaver [[(20)]] able to permute the symbols of each code word $\underline{v} = (v^0, v^1, \ldots, v^{n-1})$ so as to form a word to be transmitted

$$\underline{v}^* = \left(v^0, v^{q-1}, v^{2(q-1)}, \ldots, v^{(p-1)(q-1)}, v^1, v^q, v^{2q-1}, \ldots, v^{(p-1)(q-1)+1}, \ldots, v^{n-1}\right),$$

and a modulator [[(103)]] for modulating the symbols of said word to be transmitted $\underline{v}^*$.

18. (Currently Amended) Data reception apparatus [[(70)]], ~~characterized in that it comprises~~ comprising a demodulator [[(106)]] for demodulating the received data so as to form interleaved received words

$$\underline{r}^* = \left(r^0, r^{q-1}, r^{2(q-1)}, \ldots, r^{(p-1)(q-1)}, r^1, r^q, r^{2q-1}, \ldots, r^{(p-1)(q-1)+1}, \ldots, r^{n-1}\right),$$

where q is an integer greater than 2 and equal to a power of a prime number, p an integer greater than 1, and $n = p(q-1)$, a deinterleaver [[(30)]] for permuting the symbols of each interleaved received word $\underline{r}^*$ so as to form a received word $\underline{r} = (r^0, r^1, \ldots, r^{n-1})$, and a decoding device according to Claim 13.

19.-21. (Canceled)

22. (Currently Amended) Method of decoding received symbols, ~~characterized in that it comprises~~ comprising the steps of:

determining a current state of transmission;

selecting one of a plurality of available decoding algorithms in accordance with the current state of the transmission determined in said determining step; and

decoding the received symbols by using the selected decoding algorithm.

23. (Currently Amended) Decoding method according to Claim 22, wherein ~~it is determined~~ said determining step includes determining whether or not a mean transmission error rate exceeds a predetermined threshold ~~in said determined step~~, and [[in]] said selecting step[[,]] includes selecting a first decoding algorithm ~~is selected~~ if the mean transmission error rate is determined to exceed the predetermined threshold and selecting a second decoding algorithm ~~is selected~~ if the mean transmission error rate is determined not to exceed the predetermined threshold.

24. (Original) Decoding method according to Claim 23, wherein the second decoding algorithm is lower in performance but faster in processing than the first decoding algorithm.

25. (Original) Decoding method according to Claim 23, wherein the first decoding algorithm is the Feng-Rao algorithm.

26. (Original) Decoding method according to Claim 23, wherein the second decoding algorithm is an algorithm based on the Reed-Solomon code.

27. (Currently Amended) Device for decoding received symbols, ~~characterized in that it comprises~~ comprising:

determination means for determining a current state of transmission;

selection means for selecting one of a plurality of available decoding algorithms in accordance with the current state of the transmission determined [[in]] by said ~~determining step~~ determination means; and

decoding means for decoding the received symbols by using the selected decoding algorithm.

28. (Currently Amended) Computer program stored in a computer-readable medium, ~~characterized in that it comprises~~ comprising computer program code instructions for executing the steps of a decoding method according to Claim 22.